CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Randall Tyler Hanson

Public Comments

No public comments were received for this proposal.

Technical Synthesis Panel Review

Proposal Title

#0221: CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Final Panel Rating
inadequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

The goal of the work is to update an operational hydrologic model that simulates ground−water and surface−water flow in a small coastal watershed. Future CVP deliveries are planned and the investigators argue that an improved model will allow better allocation of resources and evaluation of future conditions under climate change. The work focuses on developing a land use module based on remotely sensed data, allowing more easily updated crop mapping and using existing models to develop an optimization/management model to guide operation/planning. The model is to include an ability to estimate groundwater pumpage, components to optimize water delivery and agricultural profits, new constraints for steelhead needs, and linkages to climate models. The authors state that the work will produce tools and methods that can keep hydrologic modeling current and provide improved evaluation of CALFED restoration activities. The proposal received four technical reviews, receiving ratings of VERY GOOD, VERY GOOD, GOOD, and FAIR. All reviewers recognize the benefit of such a model, although two find that the justification for a new, updated model is not given. One finds that the proposal contains no hypothesis or problem statement, such that it is not a genuine science research project. All reviewers note a lack of detail in the approach and methods.

One notes that there is no field data collection or monitoring; another notes that the proposal is unclear as to level of optimization model to be developed. One reviewer notes that no conceptual model is given and that there is insufficient discussion of methods for integrating the different models. Two reviewers question the size of the budget. One review notes that most of the labor costs are for senior personnel, which seems inefficient. The overall ratings for the proposal are surprisingly high, given its flaws, most of which are recognized by one or more reviewer. Clearly an easily updateable water resources optimization model incorporating climate change is a useful and relevant tool. But this proposal does not provide adequate explanation of why this model in particular should be updated, what the particular modeling issues and tradeoffs will be in the optimization, nor does it provide sufficient information to judge how it the models will be developed. The proposal states that an updated model would be helpful but does not explain how or why. In addition, the proposal is weakly developed: it is filled with hard to decipher, run−on sentences and typos and the task descriptions are merely cut−and−paste of text that has already been presented and is insufficiently specific. The deliverables are only generic journal articles, USGS reports, and scientific talks – no apparent connection with water managers or practical dissemination of the results is given. The budget is enormous and has insufficient detail. For example, nearly one million dollars are requested for other direct costs, with justification listed as only "tbd"! The proposal is clearly "inadequate" and actually unfundable.

Additional Comments:

The goal of the work is to update an operational hydrologic model that simulates ground−water and surface−water flow in a small coastal watershed. Future CVP deliveries are planned and the investigators argue that an improved model will allow better allocation of resources and evaluation of future conditions under climate change. The work focuses on developing a land use module based on remotely sensed data, allowing more easily updated crop mapping and using existing

models to develop an optimization/management model to guide operation/planning. The model is to include an ability to estimate groundwater pumpage, components to optimize water delivery and agricultural profits, new constraints for steelhead needs, and linkages to climate models. The authors state that the work will produce tools and methods that can keep hydrologic modeling current and provide improved evaluation of CALFED restoration activities. The proposal received four technical reviews, receiving ratings of VERY GOOD, VERY GOOD, GOOD, and FAIR. All reviewers recognize the benefit of such a model, although two find that the justification for a new, updated model is not given. One finds that the proposal contains no hypothesis or problem statement, such that it is not a genuine science research project. All reviewers note a lack of detail in the approach and methods. One notes that there is no field data collection or monitoring; another notes that the proposal is unclear as to level of optimization model to be developed. One reviewer notes that no conceptual model is given and that there is insufficient discussion of methods for integrating the different models. Two reviewers question the size of the budget. One review notes that most of the labor costs are for senior personnel, which seems inefficient. The overall ratings for the proposal are surprisingly high, given its flaws, most of which are recognized by one or more reviewer. Clearly an easily updateable water resources optimization model incorporating climate change is a useful and relevant tool. But this proposal does not provide adequate explanation of why this model in particular should be updated, what the particular modeling issues and tradeoffs will be in the optimization, nor does it provide sufficient information to judge how it the models will be developed. The proposal states that an updated model would be helpful but does not explain how or why. In addition, the proposal is weakly developed: it is filled with hard to decipher, run−on sentences and typos and the task descriptions are merely cut−and−paste of text that has already been presented and is insufficiently specific. The deliverables are only generic journal articles, USGS reports, and scientific talks – no apparent connection with water managers or practical dissemination of the results is given. The budget is enormous and has insufficient detail.

For example, nearly one million dollars are requested for other direct costs, with justification listed as only “tbd”! The proposal is clearly “inadequate” and actually unfundable.

Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

All external reviewers noted a significant lack of detail in the proposal. The panel agreed that there was insufficient detail to determine how the model will be updated or its products disseminated, among other things. The proposal is poorly−written and poorly−documented. The budget is extraordinarily large and very poorly described or justified.

Rating: Inadequate

Technical Review #1

proposal title: CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**Are the goals, objectives …? Answer: The goal, objectives, and hypotheses are clearly stated and internally consistent (3.0/3.0).** **Is the idea timely and important? Answer: Yes. The idea is timely and very important. The idea addressed an important issue of water export from Bay−Delta to the satellite basin. The proposed project will develop an operational model to optimize the pumpage and stream flow in the satellite basin, which addresses CALFED priority research areas and closely linked to local water management practice (2.0/2.0).** **Rate: 5.0 (Excellent).**
Rating	**excellent**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**Is the study justified relative to existing ...? Answer: The proposal proposed to apply the state−of−art knowledge. The study proposed to**

	integrate a number of sophisticated models including the FARM package, the FMP and GWM optimization routines, and the PCM climate model. Remote sensing and satellite data are also proposed. However, the proposal lacks the detail descriptions on how to integrate all the models. (1.4/2.0) **Is a conceptual model …? Answer: The proposal didn't mention a conceptual model. Instead, the project consists of six inter−related tasks. The underlying basis of the proposed tasks is explained in the background session. (1.0/2.0)** **Is the selection of research, pilot, or … Answer: The proposed project is a research demonstration project with direct application to local water management practice. (1.0/1.0)** **Total: 3.4 (Good)**
Rating	**good**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**Is the approach well designed and appropriate for meeting …? Is the approach feasible? Answer: The approach by integrating various models requires more detailed descriptions. Additionally, the integrated model requires verification and testing before applying to the satellite site. It seems no field data was proposed to verify the simulation model. No monitoring was proposed to get field data. How to integrate these models? How to overcome spatial and time scales differences of these models? How data are transferred between these models? These questions need**

	to be addressed to convince the reviewer the feasibility of the approaches. (0.5/2.0) **Are results likely to add to the base of knowledge …? Is the project likely to …? Answer: The proposed project is very likely to generate new tools for watershed management. However, the integration of climate, groundwater, surface water, and tidal flow modeling is very complex. The proposal should provide detail technical information on model integration, calibration, and verification for reviewer to evaluate its feasibility. (1.0/2.0)** **Will the information ultimately be …? Answer: The information will directly benefit decision makers. (1.0/1.0)** **Rate: 2.5 (Fair).**
Rating	**fair**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**Is the approach fully documented and technically …? Answer: The approaches were not very well documented. Especially, the proposed modeling approach seems to cover a wide range of scientific areas that requires significant integrations. (1.0/2.0).** **What's the likelihood of success? Answer: The likelihood of success depends on the model integration and available verification data. Because the approach is not clear, the likelihood of success is 50%. (1.0/2.0)** **Is the scale of the project …? Answer: Yes. The reviewer thinks the selection of a satellite**

	basin for this demo project is appropriate. (1.0/1.0) Rate: 3.0 (Good)
Rating	**good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	
Rating	**not applicable**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**Are products of value likely from the project? Answer: Yes. Products of value are likely from the project if successful. (1.5/2.0)** **Are contributions to larger data management systems relevant …? Answer: The product of this project is an operational model for managing water export from Bay−Delta to satellite basin. It will contribute to the larger data management system if successful. (1.5/2.0)** **Are interpretive … Answer: Yes. The model will be applied to a water management practice. (0.5/1.0)** **Rate: 3.5. (Good)**
Rating	**good**

Additional Comments

Comments	**In general, it's a very good proposal except 1) a clear conceptual model should be presented; 2) model integration method should be addressed; 3) data collection and monitoring plan are needed to verify the model. The project will develop an effective management tool to address the effect of water export to satellite basin.**

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**What is the track record of …? Answer: Their records are good, but needs more experience in inter−disciplinary projects (1.7/2.0).** **Is the project team qualified …? Answer: The project team needs an agricultural engineer and a remote sensing scientist (1.0/2.0).** **Do they have available the …? Answer: The required infrastructure is computer cluster, which seems to be easily accessible. (1.0/1.0) Total: 3.7 (Good)**
Rating	**good**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**The budget is reasonable, if including data collection, the budget shall be increased. (4.0/5.0)**
Rating	**very good**

Overall

Provide a brief explanation of your summary rating.

Comments	**The reviewer gave each question under each category fixed points, for example, there are two questions under Goals, the first one worth 3.0 points, and the second one worth 2.0 points. If two questions are similar, the reviewer will group these two questions. The reviewer gave points to the proposal depending on how well the questions were answered in the proposal. If the questions were addressed perfectly for one category, the proposal will get 5.0 (excellent). Otherwise, fewer points will be assigned.** **Overall rating is depending on the summation of all points divided by seven, and the points were obtained from seven categories excluding the "not applicable" ones.** **The overall rating =(5.0+3.4+2.5+3.0+3.5+3.7+4.0)/7.0= 3.58** **5.0=Excellent; 4.0−5.0=Very Good; 3.0−4.0=Good; 2.0−3.0=Fair; 1.0−2.0=Poor.**
Rating	**good**

Technical Review #2

proposal title: CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**Scientific research is not the focus of the subject proposal; consequently, it contains no hypotheses. Still, neither the goals nor objectives are clearly defined. Regardless, the significance of the proposed work needs to be clearly qualified and quantified. For example, if irrigation water is scarce, what are the magnitudes of the deficit and the economic repercussions? As described, the proposed work would involve linking several extant models, representing the hydrologic impacts of agricultural activities, in order to test the efficacy of various water allocation schemes relative to production. Neither the allocation strategies nor the metric by which the various strategies are to be evaluated are quantified, even in a cursory way. The reader is left to guess that water conservation might be one objective and another could be farm income. These objectives were not discussed. Perhaps the most glaring omission from the proposal is that of a clear, definitive problem statement. From an outsider's perspective, the need for this work is wholly unjustified based on the contents of the proposal. From a practical standpoint, the goals and objectives need to be formulated within the context of a well defined problem.**
Rating	**poor**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**While the selection of models is well justified, their application is not. Lacking relevant goals and objectives, the justification for the proposed methodology is weak at best. Clearly there are considerable data that could be used by a variety of models to address the many questions of water allocation and what the economic or environmental impacts might be but the use of the selected models seemed to be justified more on familiarity than the specific problems to be solved. On the other hand, the proposed pilot project seems to represent a general class of allocation issues from which the results could be transferred and used in other California settings. Ignoring the lack of specific goals, the justification for the pilot project seems good but this does not obviate the need for a clear problem statement.**
Rating	**fair**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The analytical methodology is most appropriate and feasible. The use of satellite imagery to drive hydrologic models is not particularly innovative, but appropriate. Satellite imagery that is currently available makes possible the seasonal, if not monthly, characterization of vegetative cover from which estimates can be derived for evaporation and**

	transpiration. The proposed monthly time scale, on the other hand, seems inappropriate. Coastal California experiences prolonged dry summers and short, variable rainy winters. The hydrology of the summer months might be well represented by a model using a monthly time step but the rainy season would not. This season would require, at a minimum, a daily time step to adequately represent evaporation, infiltration, soil moisture and storage, and groundwater storage. Further justification of the models to be used is needed. From a scientific standpoint, the proposal does not suggest a methodology, or use of models, that would likely result in a new understanding of the hydrologic cycle or, for that matter; result in some novel decision process. On the other hand, the proposed work could result in a more circumspect and, therefore, a more efficient water allocation strategy.
Rating	**good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**The proposed methodology is technically feasible. The use of satellite data with hydrologic models has been tried, tested and applied for a number of years. If the overriding objective of the proposal is to construct a methodology based on these data and hydrologic models, the project will be a success. The authors seem to have a very extensive knowledge of the hydrologic processes, data availability and model structures and operations.**
Rating	**very good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control

comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**The proposed work does not lend itself to monitoring, although it might be useful to include a component in the work that would test past allocation strategies and compare them to the allocation that might result from the new, proposed methodology.**
Rating	**not applicable**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**The products to be derived from the work are listed but not extensively described. A set of products that is not mentioned is progress reports. For the proposed three year work effort, quarterly progress reports should be required. At the end of the first quarter, a detailed, annotated outline of the final report should be produced. This outline will help focus the work effort and keep the investigators' attention focused on the end product. At the beginning of this outline should be a restatement, or simply the qualified and quantified statement, of the problems to be addressed and goals and objectives to be met.**
Rating	**fair**

Additional Comments

Comments	**The proposal seems to have been written by and for the "initiated." The personnel involved with water allocation may be fully aware of the need to conserve water while maximizing certain**

	economic conditions but, nonetheless, these issues should be stated in the proposal to make certain that everyone is in agreement with the problems to be solved.

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The research team is outstanding but, perhaps, it is too well qualified. They have had experience in managing large projects and in the details of hydrologic modeling. Their resumes leave little doubt as to their capability to undertake and successfully complete the proposed work. If there is a shortcoming with the project team, it may well be in the practical understanding of the problems facing CALFED in its efforts to efficiently and fairly allocate agricultural water supplies. If anything, the project team seemed to be overqualified. The use of graduate students or less senior personnel would seem appropriate and would reduce the overall costs.**
Rating	**excellent**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**The proposed budget, totaling $3.6 million, seems quite high. Based on an analysis of the labor costs, the principal investigators will be spending a third of their time on this project for three years. This seems excessive. Given the large academic and governmental organizations involved in the work, junior staff should be assigned the mundane tasks of data assembly, model calibration and execution, and report preparation. The fringe benefits and overhead expenses, while large, probably cannot be avoided. On**

	the other hand, the expense category labeled "other," in the proposed budget, is quite large, 26% of the total, and unexplained. Is this money intended for clerical and technical assistance or will it be spent on software and computers? The summary table, given below, illustrates the problem—26 percent of the budget falls within the "other" category. **Labor Benefit Expenses Other Overhead Total Cost 1,322,897 147,322 57,426 953,103 1,126,793 3,607,541 Percent 37 4 2 26 31 100** **This quarter of the budget should be as well explained as the two percent for expenses is explained. The entire budget needs to be better documented and explained. For example, why do the senior staff account for all of the labor costs?**
Rating	**fair**

Overall

Provide a brief explanation of your summary rating.

Comments	**While the need for the proposed work may be clear to some, it was not clearly explained in the proposal. The goals and objectives of the proposal need to start with a clear problem statement. Certainly, adequate spatial and temporal land cover data are available and appropriate computer models exist that could incorporate these data. A reasonable enough representation of the water resources setting can be produced to allow an evaluation of alternative water allocations. Still, the proposal lacks the specificity needed to assess the value of the proposed work. The project team seems to be well qualified to undertake the work. The budget, on the other hand, needs more thought.**
Rating	**fair**

Technical Review #3

proposal title: CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The objectives of the project are to develop a method to estimate cropping patterns from remote sensing data as input to a hydrologic model of a Satellite Basin, develop an optimization−management tools to augment operational as well as planning of ground and surface water flow, perform the utility of the model for mitigation of seawater intrusion in the basin, and establish linkages to climate models in order to extend the capabilities of the developed model to assess operational and forecasts scenarios of the supply and demand. The key concept of the proposal is to develop linkages and data relations relevant to satellite basins that integrate the relations between land use, hydrology and water resources. The idea is timely and important.**
Rating	**excellent**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The proposed tasks for each goal of the project would be more vivid if the authors would have explored further details of each task scenarios. It would have**

	been better if the solution approach of each task in the proposal would have been more concise and specific to the goals rather than the general solution approach stated in the proposal.
Rating	very good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	As stated in the proposal, the assessment of water management tools to a satellite basin will be made and the link of the model to climate models and assessment of local impacts of deliveries will be performed. The details of each project task would have been more vivid if the authors would have further explored each task in more details. Task 1: As the authors agree that the alternative to detailed land−use maps is the application of remotely sensed data and the relation between MODIS and AVIRIS remote sensing data will provide an efficient means of estimating crop types and cropped acreage on a monthly basis. The authors have not described in details how the different spatial, temporal, and radiometric resolutions of different satellite data will be leveraged and how the extraction of such data will be made. For such data to be made useful for the input to hydrologic model, the details of such study have not been incorporated in the proposal. The proposed detail in task 1 is rather general. Task 2: The authors have stated the associated capabilities of FMP for simulating the ground water and surface water components of the Central Valley Irrigation project. The dynamic allocation of ground water recharge and ground water pumping based on crop

water demand, surface water deliveries and depth to water table can be made by FMP. It would have been better if the authors would have mentioned the likelihood of success of such determination in the proposal. How the climate change would affect the ground water as well as surface water deliveries would have been briefly mentioned in the proposal. It would be more specific if the authors would have explained the ground water demand and change in future demand/change scenario due to the probable future climate change and increase in population of the study basin. It would have been better if the types of future climate change would have been mentioned in the proposal and how those changes would impact the surface water supply and how the proposed model would have mitigated the likelihood of excess/deficit of surface water demand would have been mentioned in the proposal. Moreover, the complexity of the climate change and the probability of the future ground water stress would have been addressed in the study.

Task 3: The authors want to use the FMP and GWM modules of MF2K to develop the optimization routines in order to evaluate the need for supplemental wells and development of decision rules for surface water deliveries. They have mentioned various sets of optimization procedures by varying the constraints. The GWM optimization incorporates reliable and sustainable water−supply delivery for major climate cycle, whereas the FMP optimization incorporates the agricultural profit against irrigated acreage given constrained water−supply deliveries for a major climate. The measures of success include alteration of coastal ground−water levels, changes in ground water storage and ultimately the reduction in seawater intrusion along the coast. It would have been better if the authors would have described about how the optimization routine will be processed. How the linkage would be made in response to uncertain precipitation and temperature events. How the stressors would be influenced from unprecedented

	precipitation events. Task 4: The authors proposed to develop additional surface−water optimization features to augment the ground−water constraints. The detail explanation of how the model will be used to assess the effects of surface water deliveries on ground water system would have been described in the proposal. The reviewer understands that the proposed stream flow constraints related to local surface water needs will be incorporated in the study. However, the brief discussions of such study have not been made in the proposal. **Task 5: The reviewer gets confused. It is because the authors are not clear whether they attempt to develop 'preliminary' optimization models or 'optimization' models. Under the section of general plan of the work, the task five has been mentioned as the development of optimization models and then under the detail description section, this has been changed to develop 'preliminary' optimization models. It shows that the authors are not clear what they are trying to develop. The authors have not mentioned previously developed decision rules, however they have proposed to develop additional decision rules related to climate variability and climate change. Does that mean they want to modify the previously developed decision rules? Or totally new rules or if different than previously developed rules, how different those rules would be developed and would add additional knowledge to the change in climate variability into the decision process?**
Rating	**very good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**The approach is documented and technically feasible. The likelihood of success of proposed project is high.**

	The scale of the project is consistent with the objectives and within the grasp of authors. The reviewer's comments are on the details of each task proposed in the proposal.
Rating	**very good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**There are plans to interpret monitoring data and develop information.**
Rating	**very good**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**The proposed project will hopefully develop new tools coupled with new data analysis system, which will provide a mechanism to develop new tool that will help to add values in larger data management systems.**
Rating	**very good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The team is well qualified for the proposed project. All team members have excellent track records of the historical accomplishment of numerous projects in similar area of specialization to the proposed study.**
Rating	**excellent**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**It seems that there is a deviation between the nature of the project and the allocated budget. Since for most of the tasks, the justification has not been made in the proposal, the budget seems rather ambitious.**
Rating	**good**

Overall

Provide a brief explanation of your summary rating.

Comments	**The objectives and goals of the project are fine and the problem definition is clear. The details to accomplish such goals would have been more clear if the authors would have gone further details of each task. The goals and objectives are excellent. Solution approach is very good. On an overall, the proposal is very good.**
Rating	**very good**

Technical Review #4

proposal title: CALFED Water−Management Tools for Bay−Delta Water Deliveries to a Satellite Basin, Pajaro Valley, California

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The basic goal of developing a tool to help the local agency make the best use of local surface, ground water and a variable import supply is very worthwhile. The timing is quite appropriate as the import project (pipeline) is about to be built. What is not clear is the need for such such a detailed water use (demand) procedure or the need to incorporate an agricultural profit segment in the optimization model task.**
Rating	**good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The project is proposed as a pilot project in a small enough basin for the ingredients to be manageable in the 3 year time frame. If it works well, the methods can be applied in much bigger export service areas. So, in a sense, this would be a pilot project for other larger areas, but would be complete for the coastal Pajaro basin.**
Rating	

	very good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The approach appers very thorough. The resulting model should be quite useful to the Pajaro Valley Water Management Agency and would be workable even if not completely accurate.**
Rating	**very good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**It is well documented and feasible, albeit costly. One wonders if a simpler modeling approach with hands on experience by local agency staff would suffice.**
Rating	**excellent**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**The ultimate goal is to combat underground sea water intrusion as economically as possible and preserve high value farm production. Monitoring of water tables, with some testing of groundwater salinity, are definite needs. It appears that the local agency is prepared to do this.**
Rating	

	very good

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**The primary value is a management tool to help the local water agency manage its three sources of supply. The general concepts would apply to any service but a new basin would require a model tailored to the new area. A big share of the cost is developing the required local data.**
Rating	**very good**

Additional Comments

Comments	**The authors of the proposal are obviously mindful of the potential for broader application of this methodology. The last task, developing climate model linkages, is probably the best part of the proposal and would be more easily transferable for other regions. I question the value of the economic optimization portion of Task 5. This is an area of volatile high value truck crops, with prices quite variable from year to year. Let the farmers decide the risk. The model then would be set up to most economically meet the water needs from sources available that year.**

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	

	The lead investigator has done excellent groundwater work in southern California in Ventura County. The secondary staff person is a prolific productive worker and very capable. I don't know the others but they appear to be good complementary team members. It is good to have a local agency man, Mr Lear, as part of the work force and eventually the one who will use the model for the benefit of his agency.
Rating	**very good**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**The total of $ 3.6 million should be adequate. The first two tasks, at about $ 1.66 million, seem quite expensive. A complete Dep't of Water Resources land use survey probably could be done for $ 20,000 which could be repeated 3 or 4 times a year for the 3 year length of the project for around $ 200,000. These acreages plus CIMIS data could be used to compute water use by field− probably for $ 300,000. A check by satellite derived evapotranspiration by Sebal North America or similar methods could be made cheaply. The other four task items appear reasonable with Task 5 scaled back a bit as noted above.**
Rating	**good**

Overall

Provide a brief explanation of your summary rating.

Comments	**The overall proposal would provide the local water agency a good management tool and some perspective on how their system would fare in a different climate. It seems to this reviewer that a much simpler project making use of existing Department of Water Resources land use surveying and calculated water use would**

	suffice and could replace the very expensive Task 1 and 2 inputs to the proposed modeling.
Rating	**very good**